

REMARKS

Applicants thank the Examiner for the courtesy extended to Applicants' attorney during the interview held June 30, 2004, in the above-identified application. During the interview, Applicants' attorney explained the presently-claimed invention and why it is patentable over the applied prior art, and discussed other issues raised in the Office Action, particularly the election of species. The discussion is summarized and expanded upon below.

The rejection of Claims 21-25, 30-32, and 38-42 under 35 U.S.C. § 102(b) as anticipated by U.S. 5,004,509 (Bristol) is respectfully traversed. Bristol discloses a low residue soldering flux containing a non-subliming dibasic acid mixture of succinic, glutaric, and adipic acids, as part of either a rosin-containing flux or a rosin-free flux. The currently amended and previously presented claims, on the other hand, now require that the soldering flux comprise an adhesive resin including a thermo-setting resin that starts heat-hardening approximately at the reflow temperature, which adhesive resin provides a substantial degree of fixing an electronic component on a component mounting board when the temperature is raised approximately to the reflow temperature. With regard to the new claims herein, the specification herein at page 36, lines 20-26 describes that "[s]ince the viscosity of the adhesive resin is lowered by raising the temperature of the flux to a level approximately matching the repair temperature to cause the carboxylic acid with the higher melting point to melt, the electronic component can be separated from the component mounting board. As a result, it is possible to re-solder the electronic component . . . while retaining the bonding function." This subject matter clearly distinguishes the three-acid mixture of Bristol, which is described as "capable of **essentially completely volatilizing during heat soldering** to leave the site **essentially free from ionic residue**" (column 3, lines 13-16; emphasis added). Moreover, while Bristol recognizes other dibasic acids are known, the three-acid mixture of

DISCUSSION OF THE AMENDENT

The specification has been amended to correct the entry for sample 55 in Table IV, as supported in the specification at page 48, lines 15-17.

Claims 21, 30, 38, 47, 56, 65 and 67 have each been amended by inserting that the adhesive resin includes a thermo-setting resin that starts heat-hardening approximately at the reflow temperature, and thus incorporating at least the subject matter of Claims 24, 31, 41, 50, and 59, respectively, therein, and page 37, lines 3-8 of the specification. See the disclosure of Embodiment 4, beginning at page 20, lines 3 of the specification. The latter claims have been canceled as now redundant. The dependency of various claims has been changed to be consistent with the above-discussed amendment. Also, Claim 46 has been corrected to depend on Claim 45.

New Claims 70-85 have been added. The new claims are drawn to an embodiment that characterizes the function of the two types of carboxylic acids, and are supported in the specification at page 36, line 12 through page 37, line 11.

No new matter is believed to have been added by the above amendment. Claims 21-23, 25-30, 32-40, 42-49, 51-58, and 60-85 are now pending in the application.

Bristol must be composed of the three acids discussed above. Note also that Bristol discloses that acids such as pimelic and higher acids are undesirable (column 11, line 27ff).

For all the above reasons, it is respectfully requested that this rejection be withdrawn.

The rejection of Claims 47-51 and 56-60 under 35 U.S.C. § 103(a) as unpatentable over Bristol in view of U.S. 6,228,678 (Gilleo et al), is respectfully traversed. The Examiner relies on Gilleo et al for their disclosure of a particular electronic circuit structure. However, Gilleo et al does not remedy the above-discussed deficiencies in Bristol because Gilleo et al neither discloses nor suggests the presently-recited soldering flux. Accordingly, it is respectfully requested that this rejection be withdrawn.

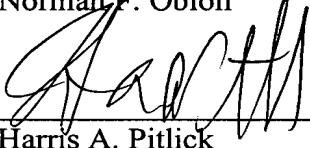
Applicants respectfully continue to traverse the election of species requirement because the species characterized by the Examiner in paragraphs Ia, Ib, and Ic in the Office Action of April 1, 2004, are not mutually exclusive, and thus, the Examiner's withdrawal from consideration of Claims 26-29, 33-37, 43-46, 52-55 and 61-64 was improper. The single general inventive concept herein, as originally claimed, is a soldering flux comprising an adhesive resin and a hardening agent, wherein said hardening agent includes at least two types of carboxylic acids having melting points that are different from each other. (The thermo-setting resin component was only an optional embodiment originally, and now a required embodiment.) The election of species requirement forecloses Applicants from claiming **any** species with regard to, for example, mixtures of particular carboxylic acids for the hardening agent component, wherein the chemical make-up of the hardening agent is the gist of the invention herein. The election of species requirement was thus clearly improper, and not consistent with PCT Rule 13.1. It is respectfully submitted that the election of species requirement be withdrawn, and that all pending claims drawn to the elected invention be examined.

Applicants respectfully call the Examiner's attention to the Information Disclosure Statement (IDS) filed October 6, 2004. The Examiner is respectfully requested to initial the Form PTO 1449 submitted therewith, and include a copy thereof with the next Office communication.

All of the presently-pending claims in this application are now believed to be in immediate condition for allowance. Accordingly, the Examiner, after rejoinder of non-elected method claims, is respectfully requested to pass this application to issue.

Respectfully submitted,

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